Date: Mon, 9 May 94 04:30:14 PDT
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>
Errors-To: Ham-Ant-Errors@UCSD.Edu
Reply-To: Ham-Ant@UCSD.Edu
Precedence: Bulk
Subject: Ham-Ant Digest V94 #136
To: Ham-Ant

Ham-Ant Digest   Mon, 9 May 94   Volume 94 : Issue 136

Today's Topics:

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>
Send subscription requests to: <Ham-Ant-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Ant Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-ant".

Date: 7 May 94 14:30:41 GMT
From: agate!usenet.ins.cwru.edu!ns.mcs.kent.edu!kira.cc.uakron.edu!
malgudi.oar.net!hypnos!voxbox!jgrubs@ucbvax.berkeley.edu
Subject: 2m 'Tenna for Apartment
To: ham-ant@ucsd.edu

-----BEGIN PGP SIGNED MESSAGE-----

jglazko@interaccess.com (Jack Glazko) writes:

> When I was in college, I had a radio set up for HF bands using
> some (28 ga?) magnet wire and a tuner. Did the job for what I wanted. We
> set it up by doing a midnight installation to the roof across the
> courtyard in our dorm (insulated at end), and attaching the other end at
> my dorm room window. Worked great for months, and it was up 4 stories. The
> magnet wire was almost invisible, and I didn't have any problems until it
> was hit by a high-flying football. The people on the ground never had

> any idea what they'd hit, and boy did they look surprised when the
> football took a sudden turn!

I did something similar in Garner House at UIUC in the fifties,
where my 2nd station call was K9HBV. My only problem was a guy
at the far end who spotted it and decided to hook a SWBC
receiver to it. Boy, did he get a helluva surprise the first
time I called CQ on 40 CW!

-----BEGIN PGP SIGNATURE-----
Version: 2.3a

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-----END PGP SIGNATURE-----

+---+
| Jim Grubs, W8GRT   Voxbox Enterprises   Tel.: 419/882-2697 |
| I _DO_ speak for Voxbox; in fact, I _AM_ Voxbox |
+---+

Date: 9 May 94 02:38:33 GMT
From: ihnp4.ucsd.edu!usc!math.ohio-state.edu!cyber2.cyberstore.ca!nwnexus!ole!
rwing!eskimo!wrt@network.ucsd.edu
Subject: Homebrew antenna questions
To: ham-ant@ucsd.edu

In article <2q3uoa$hce@chnews.intel.com>,
Cecil A. Moore -FT-~ <cmoore@ilx018.intel.com> wrote:
>Bruce Pea (pea@wri.com) wrote:
>: I would encourage you all to wrap wire on pvc!!
>: 73 de Bruce, N9WKE
>
>Hi Bruce, I have a number of questions for you. What is the equivalent
>quarter-wavelength resonant frequency? Did you know that an 80m
quarter-
>wave vertical has a take-off angle of 50-60 degrees on 20m-10m? What is

>your SWR on your single feed-line? Are you going to replace the
feed-line
>with coax when you add your radials? High SWR on lengthy runs of coax
>equals significant losses.

>
>The take-off angle on a vertical antenna increases above 5/8 wavelength
>to the point of uselessness especially during the sunspot low. You
>probably have a useful 80m/40m antenna but I wouldn't expect much out
>of it on 20m-10m.
>
>I suspect the reason that it doesn't load on 17m and 12m is that you
>are trying to force power into something like 3000+j2000 like my 88 ft.
>center-fed dipole on 15m.
>
>Didn't mean to rain on your parade.
>
>73, KG7BK, CecilMoore@Delphi.com

OOPS! Cecil has fallen into a common trap (no pun intended). Bruce's antenna is only 10 feet long - no matter how much wire is wound into a helical coil, it's only 10 feet from end to end. The radiation pattern is determined by the physical length of the antenna, period. The impedance, kind and type of loading coils, etc, etc, have nothing to do with it. Use Mininec, Elnec or any other antenna analysis program and you can easily verify the above. (Speaking only of single-element wire antennas, of course). With Bruce's antenna, the radiation pattern will be essentially the same on 80-10 meters. The efficiency, however is open to question. From much experience with mobile antennas, I would guess that it will work pretty well on 40, 30 and 20, and a bit less well on the other bands. 10 feet is just too short on 80, although you will get out - your overall efficiency is going to be in the 5-10% range. If you could make it 30-40 feet high, you'd notice a dramatic improvement. On the bands above 20, you have too much coil and that creates losses too. Your antenna tuner will be working overtime to compensate for too much of a good thing! A better design would be to only use as much coil as you need on those frequencies and not use the antenna tuner at all. Taps work fine, but of course you need some kind of switching arrangement. Even better than that would be to make two separate antennas - one for 80-30 meters, having JUST enough coil to resonate it on 80, and another for 20-10, likewise having JUST enough coil to resonate it on 20.

I don't want to rain too much on your parade, Bruce, but if this really were a good design, the antenna books would have it highly recommended. They don't. The laws of physics just get in the way.

73 es gl

Bill, W7LZP

Date: 8 May 94 14:55:43 -0600
From: ihnp4.ucsd.edu!sdd.hp.com!saimiri.primate.wisc.edu!news.doit.wisc.edu!
uwec.edu!hemp!whitemp@network.ucsd.edu
Subject: Loop Skywire
To: ham-ant@ucsd.edu

Hello-
     Now that the weather in this part of the country is turning Very
Nice, and classes are about to end, what else can a young (married)
man's fancy turn to? But of course, antennas!

     What I was wondering, does anyone have any comment on the loop
Skywire antenna that is in the Handbook? It looks pretty good, and the
article claimes that it does well, but I would be interested in other
comments as well.

Thanks in advance-
     Mike White
     N9UXC/KT WHITEMP@cnsvax.uwec.edu

Date: Sun, 8 May 1994 22:52:16 GMT
From: ihnp4.ucsd.edu!agate!darkstar.UCSC.EDU!news.hal.COM!olivea!news.bu.edu!att-
in!cbnewsm!jeffj@network.ucsd.edu
Subject: Mininec3
To: ham-ant@ucsd.edu

In article <01HBZCDPETMQB4WSMS@ACAD.FANDM.EDU> CCS_MAH@admin.FandM.EDU (Mark
Hemlick Ph. D.) writes:
>Hi to all,
>
>Is the mininec3 _manual_ available at any FTP sites? Please post site
>address if you know it, Thanks in advance.
>
>73 Mark KA3LFG

The Mininec3 manual is NOT available at any FTP site. However there is a
help file that I created that will show you how to use it. It is on a FTP
site whose name escapes me right now. I have uploaded Mininec.zip to Genie
and the ARRL BBS 203-666-0578 that contains Mininec3 and the help doc. Also
I uploaded the help doc to Compuserve as Mininec.doc. This help doc will
take you step by step through the process of designing a dipole after that
you should be able to design other antennas. Also explains the X,Y,Z

coordinate system and the other ins and outs of Mininec. Hope this helps!

Jeff Jones
Ab6MB

--
 Jeff Jones AB6MB | Vote out those who voted for the North American
 jeffj@seeker.mystic.com | Free Trade Agreement!
 Infolinc BBS 510-778-5929 |

Date: Sun, 8 May 1994 22:59:04 GMT
From: ihnp4.ucsd.edu!swrinde!cs.utexas.edu!convex!news.ssc.gov!fnnews.fnal.gov!
att-in!cbnewsm!jeffj@network.ucsd.edu
Subject: Mininec help file here!
To: ham-ant@ucsd.edu

Oh what the heck, here is the Mininec help file!

Here is some help for new Mininec users who don't have the manual...

How Mininec works is by taking the antenna elements that you specify
and divides them into segments. It uses the individual segments to
calculate the total currents and voltages for your antenna. so the
more segments the better the accuracy but the longer it takes for
Mininec to calculate. Mininec will ask you for the number of wires your
antenna has. A dipole has 1 wire and a 3 element beam would have 3
wires, one each for the reflector, driven and director elements. Each
one of those wires will be broken up into the number of segments that
you specify. 10 is generally a good number to use.

All individual wires consist of X,Y,Z coordinates. Think of yourself
facing broadside to a dipole or where you are now standing the wire
being parallel to you. The X coordinate comes out of the dipole at
a 90 angle right at you. The Y coordinate goes from left to right or
corresponds to the length of the dipole. The Z coordinate is the height of
the dipole above ground. All measurements are in meters. (multiply feet
by .3048 to convert to meters).

As an example, take the following wire dipole;

Beginning of wire			End of wire		
X	Y	Z	X	Y	Z
0	0	10	0	10.19	10

This would be a 20 meter dipole at 10 meters high. Easy right? Sure you say, how did he do that? OK here is how you do it.

Let's start with the beginning of the antenna, in this case a dipole;

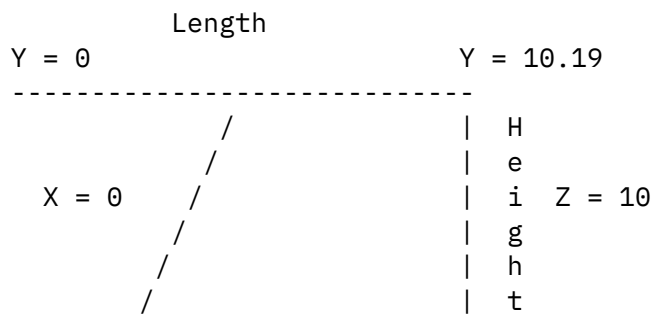
First what is X? Remember X is coming out at a 90 degree angle right at you. A dipole has nothing that comes out at a 90 angle out at you so X is 0.

Second what is Y? Remember Y corresponds to the length of a dipole. So the starting point of the length of a dipole is zero or Y = 0.

Thirdly what is Z? Remember Z corresponds to the height of a dipole. As this end of the dipole is at 10 meters above ground, Z = 10.

Now for the end of the antenna. X is 0 as there is nothing coming out at us at 90 degrees. Y is now the endpoint of the dipole and as this antenna is a 20 meters dipole Y = 10.19 (meters). Z is the height of the dipole at the endpoint and as it is the same height above ground as the beginning of the dipole Z = 10 (meters).

This is how the dipole looks to Mininec;



Remember X is coming straight out of the side of the dipole at a 90 angle right at you.

Now that you have your wire setup, the next step is the concept of Segments. This is how Mininec breaks the wires up for it's computations. 10 segments is a good number to use to start with. Mininec computes the currents and voltages in each segment and uses those results to calculate the total efficiency and radiation patterns of your antenna. The more segments the better the accuracy and the slower it's computations.

Source Pulses are where you feed your antenna at. If you have a dipole divided up into 10 segments then to feed it in the middle you would use segment 5. Basically a source pulse is nothing more then what segment you feed your antenna at.

Let's use Mininec now to create a antenna model;

FREQUENCY (MHZ)? Let's put 14 here.

ENVIRONMENT (+1 FOR FREE SPACE, -1 FOR GROUND PLANE)? Put -1 for real ground.

NUMBER OF MEDIA? Put 1 here

RELATIVE DIELECTRIC CONSTANT, CONDUCTIVITY? 13,.005 works well as this is about average ground.

NO. OF WIRES? Put 1 here as we are modeling a dipole.

NO. OF SEGMENTS? Put 10 here as this a good number for modeling.

END ONE COORDINATES (X,Y,Z)? 0,0,10 (This is beginning end of the dipole
and all numbers are in meters)

END TWO COORDINATES (X,Y,Z)? 0,10.19,10 This is the other end of the dipole
and 10.19 is the length and 10 is
height above ground. Both in meters.

RADIUS? .001 This the diameter of the wire in meters.

CHANGE WIRE NO. 1 (Y/N)? If OK put N

CHANGE GEOMETRY (Y/N)? If OK put N

NO. OF SOURCES? Put 1 here. This tells the program how many sources of power
are being applied to your antenna. Ie.. coax

PULSE NO., VOLTAGE MAGNITUDE, PHASE (DEGREES)? 5,1,0 This tells Mininec where to put the coax at. Remember the 10 pulses? Pulse number 5 is in the middle of your antenna. Voltage is 1 volt and forget about the phase just put zero there.

NUMBER OF LOADS? 0 This is for traps, resistors, etc...

You will see a menu with various options. Choose P - COMPUTE FAR FIELD PATTERNS

It will now say BEGIN MATRIX FILL

Nex it will now print out something like this;

```
PULSE 5         VOLTAGE = ( 1, 0J )
                CURRENT = ( 9.728E-03, -48.54408 J )
              IMPEDANCE = ( 68.27696, -48.54408 J  )
                  POWER = 4.864229E-03 WATTS
```

CALCULATE PATTERN IN DBI OR VOLTS/METER (D/V)? Put D here for DBI. DBI usually stands for DBs over a Isotropic Dipole. Substract 2-3 DBs to get what it would be in the real world as a Isotropic dipole doesn't exist. Dipoles are considered to have 2-3 DB gain over a Isotropic Dipolei.

Now Mininec will ask you for ZENITH angles. The Zenith goes from 0 degrees straight up to the sky swings directly out to the horizon and then to 180 degrees below the antenna all at right angles to the antenna. This corresponds to broadside radiation. Still not clear? Think like this, face the horizon, put your hand straight up, this is 0 degrees straight up. Okay, now point your hand at the horizon, this is a zenith angle of 90 degrees. Point your hand at the ground, this is a zenith angle of 180 degrees. Now here is how Mininec likes to see it. Put in 0 (starting angle),10 (how many degrees to increment), 10, (how many times to increment). This works out to start out at 0 degrees pointing straight up and increment 10 degrees towards the horizon 10 times. Or goes from 0 degrees and steps 10 degrees at a time until it reaches 90 deg. At 0 and each 10 degrees Mininec will calculate the strength of the radiation pattern in DB's. Also 90,-10,10 will also work. This starts at 90 degrees straight off the side and works back up to 0 degrees. This is exactly the same as 0,10,10 only it does it backwards. Also you can use even smaller increments like 0,5,20. This will calculate at every 5 degrees from 0 to 90 degrees. What ZENITH really does is calculate the radiation angles off the side of your antenna. So when Mininec asks the following;

ZENITH ANGLE : INITIAL, INCREMENT, NUMBER? Put in 0,10,10.

Now Mininec will ask you for the Azimuth angles. 0 degrees corresponds to pointing straight out towards the horizon at 90 degrees from the center of the dipole. Imagine you are standing facing the horizon. If you point your hand straight out towards the horizon this is Azimuth angle of 0 degrees. Now keep it out and move it sideways 10 degrees to your left. This a Azimuth angle of 10 degrees. If you had moved it to your right this would have been a Azimuth angle of -10 degrees. What the Azimuth angle is really good for is seeing if there is cloverleaf pattern off the broadside of your dipole or for seeing the amount of front, side and back radiation on Yagi antennas. As we are not interested in this at this time do the following;

AZIMUTH ANGLE : INITIAL, INCREMENT, NUMBER? Put in 0,0,0

FILE PATTERN (Y/N)? Put N or this will save the results into a file and you will have to view the file to see the results.

Mininec will now calculate the Far Field pattern for you. You will see 5 columns named respectively; ZENITH ANGLE, AZIMUTH ANGLE, VERTICAL PATTERN (DB) HORIZONTAL PATTERN (DB), TOTAL PATTERN (DB). Under the columns with the (DB) after their names is the calculated amount of power in DB's your antenna is putting out. The TOTAL PATTERN is what you want to look at. This is the power output in DB's that your antenna is calculated to be radiating and has

the most useful figures. Due to the way the Mininec calculates using the ZENITH ANGLE and numbers of 0,10,10 it will be backwards compared to published antenna radiation pattern charts. 90 degrees is actually 0 degrees and 80 is 10, 70 is 20, etc... on antenna radiation pattern charts. You can either just convert it in your head or do put 90,-10,10 instead of 0,10,10. Then is will correspond to antenna radiation charts.

For some more good information and help get a copy of the 1991 February QST article called "MININEC: The Other Edge of The Sword".
Also get Volume 3 of "The ARRL Antenna Compendium" as there is a great article called "Modeling HF Antennas with MININEC" that is really helpful. These 2 resources will really deepen your understanding of Mininec!

Here's some good figures for RELATIVE DIELECTRIC CONSTANT and CONDUCTIVITY for ground;

20,.03	Very good ground	Rich soil
14,.01	Good ground	Rich soil
13, .005	Average ground	Heavy clay soil
12-14, .002	Poor Ground	Cities, Industrial Areas
5, .001	Very poor ground	Cities, Industrial Areas, High building.

Also here is some more good information that will make your life simplier when designing a antenna on Mininec. Rather then inputing the wires and segments manually each time use MNPRE.EXE that comes with Mininec. First create a file called XXXX.NEC that has the following format;

GW,,pulses,X1,Y1,Z1,X2,Y2,Z2,diameter.

Using a text editor let's make a file called 20METER.NEC that looks like this;

GW,,10,0,0,10,0,10.19,10,.001

Run MNPRE and it will ask you for a file called XXX.NEC. Just put in 20METER.NEC. It will create a file called MININEC.INP and as long as it is in the same directory as Mininec it will use data from MININEC.INP to create the wire portion of the antenna.

If you have any more questions send email to me here or to j.jones91@genie.geis.com. The address in my .sig is not good any more. 8-)

Jeff
--
Jeff Jones AB6MB | Vote out those who voted for the North American
jeffj@seeker.mystic.com | Free Trade Agreement!

Infolinc BBS 510-778-5929 |

Date: 8 May 94 14:33:45 GMT
From: news-mail-gateway@ucsd.edu
Subject: Noise in apartment antenna + 20
To: ham-ant@ucsd.edu

While awaiting my license, I bought an Icom 720 A and tried stringing
up a simple horizontal dipole. I am getting +20 static whenever I rig
up the antenna. I'm using speaker wire for the antenna and speaker
wire for the ground. Unhooking the ground seems to do nothing at all.
Any antenna I rig up seems to just bring on the noise. Unfortunately,
I'm new at this so all serious suggestions wil be accepted. BTW, of
course my apartment has a no antenna policy and I am on the first floor.

My new HTX 202 handie talkie seems to receive fine. An old Zenith shortwave
radio picked up some stuff, real bad at times but I could usually find
WWV. I took the Icom over to a friend's house last night and on his
antenna he got Mexico and Alabama just fine.

davev@atkc.com

Date: 9 May 94 03:12:51 GMT
From: ihnp4.ucsd.edu!usc!math.ohio-state.edu!cyber2.cyberstore.ca!nwnexus!ole!
rwing!eskimo!wrt@network.ucsd.edu
Subject: Noise in apartment antenna + 20
To: ham-ant@ucsd.edu

In article <9405081433.AA07741@venus.atkc.com>,
Dave van De Kerk <davev@venus.ATkc.COM> wrote:
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>up a simple horizontal dipole. I am getting +20 static whenever I rig
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>WWV. I took the Icom over to a friend's house last night and on his
>antenna he got Mexico and Alabama just fine.
>
>davev@atkc.com

When you have 20 over 9 noise on an indoor antenna on the first floor, there is good news and bad news. The bad news is your antenna is really close to the noise source (100 feet up would be far better), but the good news is you won't have to go far to find it :->

Let's narrow it down. Is the noise equally loud on all bands? Your antenna will have different responses on different bands of course, so you need to allow for that. One of the most common noise sources these days is those touch-control lamps and their evil brothers, motion detectors. These have an oscillator which would normally be well behaved, except that they feed it with raw, unfiltered pulsating DC. This makes for harmonics which are frequency-swept back and forth at a 60 Hz rate. The ones I have run across create a band of noise anywhere from 30 to 250 kHz wide, with very sharp edges. The sharp edge makes them easy to identify. For instance, the noise will cover 14.100 to 14.220 very loud, but at 14.095 or 14.225, it's completely gone. The band of noise tends to drift too, probably with temperature. I have one in my neighborhood that I could use as a thermometer if I wanted. It's not real loud, so I haven't gotten around to chasing it down.

If it's not that, then the times it's audible will help. Flourescent lights are a real noise generator. Does the noise come and go like a light being turned on and off? If it's there 24 hours a day then it's most likely a power line problem. In a way, those are the easiest because the power company will work with you, especially if you have tracked it down some beforehand.

All this is leading up to what you really need to get serious tracking it down. A portable shortwave radio. BTW, the HTX-202 is VHF and FM, and therefore pretty much insensitive to this kind of QRN. Use the shortwave to walk around the neighborhood and get a fix on the noise. If you find a suspected house, present yourself as a shortwave listener (not a ham!) and inquire if they are having trouble, too. They probably are, especially if they use AM radios, so offer to check out the house for them. Most folks are quite receptive if you make it clear that fixing the problem will help them, too.

And above all else, get the ARRL book on finding and fixing RFI. It's a gold mine of information.

One last suggestion: horizontal loop antennas have a reputation for low man-made noise pickup. Just run it around the corner of your

wall/ceiling and make it as big as possible. Feed it with a good antenna tuner using open wire line and you'll be surprised how well you get out! I worked DXCC from an apartment here in Washington State (where all the DX is a LONG ways away!) so it can be done.

73 es gl

Bill, W7LZP

End of Ham-Ant Digest V94 #136
****